THE DAYLIGHT BOMBING OF NAZI EUROPE BY

# U.S.A.A.F.™

## UNITED STATES ARMY AIR FORCE

SSI™

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### 5.4 Industry Status

The Luftwaffe player may inspect the status for each type of industry. For each city containing the selected industry the computer will display the city ID number, city name and production level for that city. A total industry level will be displayed at the bottom of the list. The number to the right of the slash is the unadjusted industry level. The number to the left is the industry level adjusted for critical industry damage (except for the aircraft industry). The adjusted levels will be set to 100 at the beginning of each game.

### 5.5 Replacement Aircraft

The player may inspect the number of replacements for each type of aircraft. For each type of aircraft available the computer will display the type ID number, type designation and the quantity of aircraft available as replacements.

The Replacement Aircraft routine may be used to change the type of aircraft being used by a particular gruppe. This is done by 'exchanging' the aircraft currently used by the gruppe for a different aircraft type available in the replacement pool. The USAAF player may not exchange fighters for bombers or bombers for fighters.

Type in the gruppe ID# for the gruppe you wish to change, then enter the type ID# to indicate the new type of aircraft. The 'old' aircraft will be added to those of the same type already in the replacement pool. The 'new' aircraft will be subtracted from the replacement pool and added to the exchanging gruppe in UNSERVICEABLE condition. The exchange transaction will not be allowed if the replacement pool does not contain adequate numbers of the selected type to allow a 1 for 1 exchange.

The exchange procedure will result in a reduction of pilot experience. When exchanging for aircraft of the same class (i.e. single engine for single engine), there will be a loss of 20% of the group's experience points. When exchanging for aircraft of a different class (i.e. single engine for twin engine), there will be a loss of 50% of the group's experience points.

### 5.6 Aircraft Production

The Aircraft Production routine may be used to examine or alter the types of aircraft being produced in a particular city. The computer will display all cities that include aircraft factories. The player must enter the city ID# for the city he wishes to examine/alter.

Aircraft cities contain three production 'slots'. Each slot will contain an aircraft type or will be empty. Aircraft cities with only one slot in use will devote their entire production to that one type of aircraft. Aircraft cities with two slots in use will devote half of their production to each of the two listed types of aircraft. Aircraft cities with all three slots in use will devote one third of their production to each of the three listed types of aircraft.

The Aircraft Production routine may be used to add a new type of aircraft to an empty slot, remove an aircraft type to create an empty slot or change an occupied slot to a different type of aircraft. The player must enter the type ID number for the 'new' aircraft type and the slot number that is to be altered. Aircraft type ID numbers are listed in section 12.0. If you wish to remove an aircraft type to create an empty slot, just enter aircraft type number '0' for a currently occupied slot.

Altering the production of an aircraft city will reduce the aircraft production level of that city. The production level reduction will be determined as follows:

(1) 60% reduction if subtracting an aircraft type to create an empty slot

(2) 20% reduction if adding an aircraft type to fill an empty slot

(3) 20% reduction if changing an occupied slot to a similar aircraft type (i.e. ME109G changed to ME109K)
Note: FW190A, FW190D, FW190F and TA152H are considered to be similar aircraft types.

(4) 60% reduction if changing an occupied slot to a non-similar aircraft type

You cannot change the production characteristics of a city if the city has a production level less than 5.

### 5.7 Aircraft Factories

The player must select the aircraft type. The computer will display each city involved in the production of that aircraft type and the production level devoted to that type.

## 6.0 USAAF MORNING BRIEFING

### 6.1 Yesterday's Operations

Similar to that described in section 5.1. On this display the Luftwaffe fighter losses will be inaccurately reported.

### 6.2 Weather Report

Same as that described in section 5.2.

### 6.3 Air Group Status

Similar to that described in section 5.3. The player must first specify the base (England, Italy, Tunisia, Libya) whose groups he wishes to examine.

### 6.4 Industry Status

Same as that described in section 5.4.

### 6.5 Replacement Aircraft

Same as that described in section 5.5.

## 7.0 USAAF TARGET ASSIGNMENT

### 7.1 Assign Raid

For each raid assigned the USAAF player must perform the following actions:

(1) select raid ID letter (A-Z)

(2) select origin base; the player must determine the base from which the raid will begin. Before 1 OCTOBER 1943, England, Tunisia or Libya may be selected. After 30 SEPTEMBER 1943, England or Italy may be selected.

(3) select target type; the following types of targets or missions may be selected:

A railyard
B ball bearings
C chemicals
D oil
E aviation gas
F electric power
G steel
H rubber
I U-boat
J armaments
K aircraft
L V-weapon
M Overlord
N flak
O airfield
P feint
Q deep escort

(4A) select target city; the computer will list all cities that contain the selected target type. The player must choose the city to be bombed. This applies only to target types A-M.

(4B) select target point; the map will be displayed with the cursor over the starting base. The player must move the cursor over the target to be bombed and press the (X) key. If the target type is FLAK then the cursor should be placed over a city square. If the target type is AIRFIELD, then the cursor should be placed over an airfield site square. If the target type is FEINT, then the cursor may be placed anywhere. This paragraph applies only to target types N.O.P.

(5) select secondary target city; secondary target type must be the same as the primary target. Selection of secondary targets is optional. This paragraph applies only to target types A-M.

(6) select offset point; the computer will display the map with the cursor over the primary target location. Move the cursor to the desired offset point and press the (X) key. The raid will fly through the offset point on the way to the target and again while returning to its base. If the raid bombed a secondary target or if it is shuttling to a different base, then it will not fly through the offset point AFTER it has bombed or passed through the target point. If an offset point is not desired, then press the (X) key without moving the cursor from the target square. Applies to target types A-P.

(7) shuttle to different base: only heavy bombers (B17F, B17G, B24D, B24J) may fly to a base that is different than the origin base.

(8) select bomber type and assign bomber groups: the player may include as many of his available groups as he wishes in a single raid. Different types of bombers may be combined in the same raid. Heavy bombers may not fly in flak attack or deep escort raids. A group (fighter or bomber) must have at least 10 serviceable aircraft in order to fly a mission.

(9) select fighter type and assign fighter groups: fighter groups that fly in the same raid as bomber groups will act as 'close escort' protection against enemy fighters. Fighter groups in deep escort missions are not required to depart at the same time as the bomber raid they are escorting. Deep escorts may join up with the bombers at various points on the route to or from the target. Fighter groups may be used to bomb AIRFIELD, FLAK, and RAILYARD (OVERLORD) targets. Fighter groups will not bomb if they are flying in the same raid with heavy bomber groups. When acting as bombers, fighter groups will fly to the target at their assigned altitude, dive to 1000 feet to attack the target, then climb back to the assigned altitude for the return to base.

(10) determine which raid to escort: this applies only to deep escort missions.

(11) assign raid altitude: the computer will display the altitude limits for each raid. Raids on AIRFIELD, FLAK, and RAILYARD (OVERLORD) targets may not fly over 24000 feet. For the best results, deep escorts should fly 1 to 3 thousand feet above the raid they are escorting.

(12) set departure time: may set any time from 600 to 1700 as departure time. Deep escorts may not depart BEFORE the raid they are escorting.

### 7.2 Examine Raid

This routine may be used to examine data from previously assigned raids. Included in the raid data display is the range to target (including offset point), raid speed and climb rate.

### 7.3 Weather Report

Same as that described in section 5.2.

### 7.4 Map Display

The map display may be used as an aid in planning raids. The cursor may be moved around the map by pressing keys 1-8 (1 = NORTH, 2 = NE, 3 = EAST, 4 = SE, 5 = SOUTH, 6 = SW, 7 = WEST, 8 = NW). If the cursor is moved over a city square and the (L) key is pressed then the city name will be displayed.

## 8.0 LUFTWAFFE DEPLOYMENT

### 8.1 Fighter Gruppe Status

Same as that described in section 5.3.

### 8.2 Airfield Status

Lists the following data for each active airfield:

(1) AF: airfield identification number
(2) LOC: the x,y location of the airfield
(3) D%: damage percentage, airfields with over 49% damage may not operate aircraft
(4) FR: fuel reserve points stored at the airfield. Each fuel reserve point is sufficient to fly 1 aircraft on 1 sortie.
(5) GRUPPE & TYPE: lists the historical designation and type of aircraft for each gruppe based at the airfield.

### 8.3 Flak Status

For following data will be displayed for each city on the map:

(1) ID: city identification number
(2) CITY: the city name
(3) HVY FLAK: the number of heavy flak batteries protecting the city
(4) LT FLAK: the number of light flak batteries protecting the city

### 8.4 Weather Report

Same as that described in section 5.2.

### 8.5 Assign Fighter Tactics

Each day, the Luftwaffe player may alter the 'tactics' assigned to some or all of his gruppes. The five tactical options are described below:

(1) ATTACK FIGHTER - BOUNCE
The gruppe will attempt to engage USAAF fighter groups but will not attack unless a positional advantage can be attained. Will engage bombers if no fighters are present.

(2) ATTACK FIGHTERS - DIRECT
The gruppe will attempt to engage USAAF fighters and will attack regardless of the tactical position. Will engage bombers if no fighters are present.

(3) ATTACK BOMBERS - BOUNCE
The gruppe will attempt to engage USAAF bombers but will only attack if a positional advantage can be attained. Will NOT engage fighters.

(4) ATTACK BOMBERS - DIRECT
The gruppe will attempt to engage USAAF bombers and will attack regardless of the tactical position. Will NOT engage fighters.

(5) ATTACK BOMBERS - ROCKET
The gruppe will attempt to engage USAAF bombers. Will not attack unless the proper rocket launch position can be attained. Following a rocket launch, the gruppe will engage the bombers with cannon fire. Will NOT engage fighters.

There are two methods for assigning tactics. The DEFAULT TACTICS method allows a tactic to be assigned to all gruppes with a particular type of aircraft. The SPECIFIC GRUPPE TACTICS method allows tactics to be assigned to individual gruppes as desired.

### 8.6 Move Fighter Gruppe

This routine may be used to move gruppes to different active airfields. The player must input the ID numbers of the gaining and losing airfields, and then the ID numbers of the gruppes to be moved. Gruppes will lose 5% of their morale each time they are moved in this manner. The MOVE AIRFIELD routine contains an alternate (and easier) method of moving fighter gruppes.

### 8.7 Move Airfield

This routine may be used to move active airfields to vacant airfield sites or move fighter gruppes to different active airfields.

(1) move airfield: move the cursor on the map display to the active airfield you wish to move. Press the (G) key to 'get' the airfield. Move the cursor to the new airfield site and press (M) to move the airfield. The airfield move procedure will result in 90% damage to the relocated airfield. Airfields may not be moved to sites that are currently occupied by active airfields.

(2) move gruppe: move the cursor on the map display to an active airfield. The airfield ID number displayed at the bottom of the text window will be inversed if the airfield contains one or more fighter gruppes. Press the (L) key to 'look' at the first gruppe. If you do not wish to move the gruppe then press the (N) key to look at the 'next' gruppe or the (Q) key to return to the map menu. If you wish to move the gruppe you are looking at then move the cursor to the desired active airfield and press (M) to move the gruppe. Gruppes moved in this manner will have their morale reduced by 5%.

### 8.8 Move Flak

This routine may be used to move flak to enhance protection of key cities. Move the cursor to the 'losing' city and press (T), move the cursor to the 'gaining' city and press (X), then specify the quantities of heavy and light flak you wish to move. A maximum of 100 flak batteries may be moved in a single day.

## 9.0 LUFTWAFFE SITUATION ROOM

The Luftwaffe player may 'enter' the Situation Room by pressing the (S) key during the Combat Phase. In the Situation Room the real time game clock is frozen while the Luftwaffe player examines his available forces and orders his various gruppes to intercept detected raids or patrol areas where activity is expected.

### 9.1 Fighter Gruppe Status

Similar to that described in 5.3. Gruppes that are flying patrols or intercept missions will not be displayed.

### 9.2 Airfield Status

Similar to that described in 8.2. Gruppes that are flying patrols or intercept missions will not be displayed.

### 9.3 Flak Status

Same as that described in 8.3.

P38G GROUPS

ENGLAND

78FG

20FG 8/43

55FG 9/43

TUNISIA-ITALY

1,14,81,82FG

350FG 11/43

P38J GROUPS

ENGLAND

370FG 2/44

474FG 3/44

367FG 4/44

P51B GROUPS

ENGLAND

354FG 11/43

357FG 12/43

364FG 2/44

ITALY

31FG 11/43

52FG 2/44

P51D GROUPS

ENGLAND

339FG 4/44

479FG 5/44

## 14.0 VICTORY DETERMINATION

### 14.1 Calculating the Score

In all scenarios (both short and campaign) the USAAF player's base score will equal the AIDL (see 11.2).

In short scenarios the FINAL SCORE will be equal to the AIDL × loss ratio. In the campaign game the FINAL SCORE equals 12 + 4 × the number of months before May 1945 that the game ended (if the game ends after May 1945 this will be a negative number).

### 14.2 Loss Ratio

The loss ratio is calculated:

loss ratio = Luftwaffe fighter losses × 2 / (2 × USAAF bomber losses + USAAF fighter losses)

In Phase III games, divide the loss ratio by 2. In all games, if the number of bombers destroyed is less than 1000 and the loss ratio is less than 1.0 then the loss ratio will be increased to 1.0.

### 14.3 Victory Levels

The final score is compared to the following chart to determine the level of victory for each scenario:

| | SHORT SCENARIOS PHASE I | II | III | CAMPAIGN ALL |
|---|---|---|---|---|
| LUFTWAFFE DECISIVE | — 0 | — 20 | — 50 | — 0 |
| LUFTWAFFE MARGINAL | 1 3 | 21 35 | 51 65 | 1 15 |
| USAAF MARGINAL | 4 7 | 36 49 | 66 79 | 16 30 |
| USAAF DECISIVE | 8 + | 50 + | 80 + | 31 + |

## 15.0 SCENARIOS

The players may select from three time periods or 'Phases' at the start of the game.

### 15.1 Phase I

Starts 1 August 1943. The USAAF has been in action against Germany for over a year but has only recently received bombers in sufficient quantities to fly 'deep penetration' raids. USAAF fighters consist of the short winded P47B and the awkward P38G.

In response to the growing USAAF threat, the Reich Air Defense has been heavily reinforced with gruppes from the Mediterranean and Eastern Fronts. Experienced German pilots flying ME109G and FW190A fighters are more than a match for their USAAF opponents. Heavily armed ME110G, ME410A and JU88G 'destroyer' aircraft have been introduced to deal exclusively with USAAF bomber formations.

When playing the Phase I SHORT game it is recommended that experienced players play the USAAF side. We also recommend that only experienced players play Phase I.

### 15.2 Phase II

Starts 1 February 1944. After some serious reverses in the second half of 1943 the USAAF has reinforced and reequipped its fighter groups. Flying large numbers of P47Ds and P38Js and a few precious groups of P51Bs the USAAF can at last provide escorts continuously to and from the target on deep penetration raids.

As the USAAF has gained experience and improved equipment, Luftwaffe quality has remained unchanged. The ME109G is still widely used despite being outclassed by new USAAF fighter types. Axis production has been reorganized and development of advanced fighter designs has begun.

### 15.3 Phase III

Starts 1 October 1944. After crippling the German fuel industries in the Summer of 44, the USAAF has victory within its grasp. As the Allied Armies bog down on the German border it is hoped that strategic bombing can hasten the collapse of the Axis war machine.

The Luftwaffe has been reduced to a shambles by the past 9 months of heavy fighting. Axis aircraft production has reached record heights but shortages of fuel and experienced pilots have made this irrelevant. Luftwaffe hopes rest on increased availability of advanced fighter types such as the FW190D, ME109K and ME262A.

All critical industries have their critical level set to 30. The ME-262A has already begun production at the start of Phase III. When playing the Phase III SHORT game, it is recommended that advanced players play the Luftwaffe side.

## 16.0 STRATEGY NOTES

### USAAF Player

**Short Games** – In the short games you should pick one industry (preferably a critical industry) that can give you a lot of points quickly, and then destroy that one industry. Ball bearings and/or rubber are good targets, as is chemicals/steel/electric power if they are available as targets. In phase I and phase II games railyards can be a good target due to its high critical level. Do not waste your time bombing targets in many different industries, as this will not score points in the short run.

**Aviation Gas** – By reducing aviation gas to below 5 (and keeping it there) you will be able to ground the Luftwaffe. Bombing chemicals if available is a good way to help keep up an aviation gas shortage, so a good time to bomb aviation gas is just after chemicals is discovered as a target. Keep in mind that you may have to wait several weeks to begin seeing the effect, and that you will have to make many deep raids against 1 and 2 point targets to maintain the fuel shortage, but the results can be well worth the effort.

**Escorts** – Proper use of your escorting fighters can make or break your grand strategy. Remember to send out your fighters on deep escort from 30-50 minutes later than the bombers so that they don't waste fuel while waiting for the slow climbing bombers to form up, and send them out at 1-3000 feet above the bombers (by staggering the elevation of your escorts the high groups will be able to bounce German fighters that are attacking your low groups). Also, don't forget to send fighters out to cover the bombers on their return trip, otherwise the Luftwaffe will devastate your home-bound bombers. Let's assume you have the following fighters available to cover a raid on Berlin which will form up at 600 at 22000 feet: 10 × P47D, 8 × P51D, 3 × P38J. A matching escort schedule could look like this:

630 – 6 P47 23000 feet
640 – 3 P51 24000 feet
700 – 3 P38 25000 feet
710 – 2 P51 25000 feet
800 – 3 P51 23000 feet
920 – 4 P47 24000 feet

This plan provides escort cover all the way to Berlin and back. This is just a suggested allocation of escorts, and it is left to you to discover the "optimum" escort tactics.

### Luftwaffe Player

**Flak** – You should attempt to concentrate flak in those cities you expect to be bombed. For example if you see that the American player is attempting to destroy your rubber plants, place 195 heavy batteries in each of the major rubber targets as soon as possible. Also, protect those industries that are especially important

to your defense (i.e. aviation gas, aircraft factories, chemicals). Never place 200 batteries in a city, for you will lose any batteries that the cities armament factories produce. Placing flak is purely a matter of anticipating the USAAF player's intentions.

**Aircraft** – Keep your single engine fighters based on airfields in France, Northwest Germany, and Italy and base your rocket firing bomber-destroyers in central and southern Germany. It is wise to concentrate a large number of airfields and air gruppes around Essen. Use your high manueverability fighters (greater than 35) to bounce enemy fighters, especially P-38 and P-51 long-range fighters. If you are successful at forcing these fighters to turn back, you can unleash your bomber-destroyers to attack deep raids into Germany. The ME410, ME110, and JU88 should be equipped with rockets and launched last, but be forewarned that if they are attacked by American fighters they will be decimated. Do not fly units with less than 20-25 serviceable planes, and pull units back to the safety of central German airfields if their morale is reduced below 40. Try to keep your best units poised on the front line airfields, but realize that you will lose morale each time you shuttle an air gruppe from one field to another.

**Patrols** – Patrols are useful in two ways. First they can be used to mass a large number of aircraft in one spot. This will allow you to launch a coordinated attack that may be able to overwhelm the escorts. Patrols can also be used to shield the French coast against USAAF fighter raids on German airfields.

**Aircraft Production** – This is your chance to build the Luftwaffe to suit your own style of warfare. It's usually a good idea early in the game to convert some or all of your ME109G factories to the production of FW190A fighters. Although this will result in lower production, you will generally find that you have all of the ME109G's you would ever want especially when you begin to convert whole gruppes to the new plane types. If you believe that the USAAF player is going to concentrate on destroying your aviation gas (and most do), it's a very good idea to convert some of your factories to ME262A production in order to speed up the arrival of your jets (remember that jets do not require aviation gas to fly). If the USAAF player does not bomb your aircraft factories, you will find that you have plenty of production capacity that can be spared on jet production. If however, the USAAF player concentrates on your aircraft factories, and he catches you converting all of your factories to new production, you may find yourself facing a critical shortage of aircraft.

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Or call our Hotline Number: *(415) 964-1200* every weekday, 9 to 5 (P.S.T.).

## VICTORY POINT MATRIX

| INDUSTRY | 0-19 | 20-29 | 30-39 | 40-49 | 50-59 | 60-69 | 70-79 | 80-89 | 90+ |
|---|---|---|---|---|---|---|---|---|---|
| railyard | 20 | 15 | 10 | 5 | 4 | 3 | 2 | 1 | 0 |
| ball bearings | 5 | 4 | 3 | 2 | 1 | 0 | 0 | 0 | 0 |
| chemicals | 5 | 4 | 3 | 2 | 1 | 0 | 0 | 0 | 0 |
| oil | 20 | 15 | 10 | 5 | 4 | 3 | 2 | 1 | 0 |
| aviation gas | 5 | 4 | 3 | 2 | 1 | 0 | 0 | 0 | 0 |
| electric power | 20 | 15 | 10 | 5 | 4 | 3 | 2 | 1 | 0 |
| steel | 5 | 4 | 3 | 2 | 1 | 0 | 0 | 0 | 0 |
| rubber | 5 | 4 | 3 | 2 | 1 | 0 | 0 | 0 | 0 |
| U-boat | 5 | 4 | 3 | 2 | 1 | 1 | 1 | 0 | 0 |
| armaments* | 30 | 25 | 20 | 15 | 10 | 5 | 3 | 1 | 0 |

* Divide armaments level by 10 before comparing to the damage matrix.

## AIRCRAFT DATA

| ID# | TYPE | CN | MV | DU | RR | SP | FU | MA | CL | C |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | ME109G | 8 | 38 | 17 | 2 | 42 | 7 | 38 | 30 | 1 |
| 2 | ME109K | 7 | 50 | 17 | 2 | 46 | 6 | 41 | 41 | 1 |
| 3 | FW190A | 10 | 44 | 18 | 2 | 44 | 8 | 37 | 18 | 1 |
| 4 | FW190D | 6 | 48 | 19 | 2 | 46 | 8 | 39 | 28 | 1 |
| 5 | FW190F | 15 | 32 | 25 | 6 | 42 | 8 | 35 | 12 | 1 |
| 6 | TA152H | 13 | 48 | 24 | 2 | 50 | 10 | 49 | 48 | 1 |
| 7 | DO335A | 19 | 45 | 19 | 2 | 50 | 13 | 37 | 30 | 3 |
| 8 | ME410A | 13 | 22 | 20 | 6 | 40 | 17 | 33 | 18 | 2 |
| 9 | ME110G | 18 | 18 | 19 | 4 | 36 | 13 | 26 | 12 | 2 |
| 10 | JU88G | 12 | 18 | 23 | 4 | 36 | 21 | 32 | 12 | 2 |
| 11 | ME262A | 20 | 14 | 14 | 6 | 68 | 5 | 38 | 28 | 7 |
| 12 | ME163B | 10 | 40 | 10 | 0 | 96 | 2 | 40 | 40 | 8 |
| 13 | HE162A | 10 | 21 | 7 | 2 | 52 | 4 | 39 | 39 | 6 |

| ID# | TYPE | CN | MV | DU | BL | SP | FU | MA | CL | C |
|---|---|---|---|---|---|---|---|---|---|---|
| 14 | P40E | 6 | 37 | 14 | 1 | 40 | 10 | 30 | 18 | 1 |
| 15 | P47B | 8 | 44 | 22 | 2 | 40 | 10 | 42 | 18 | 1 |
| 16 | P47D | 8 | 46 | 23 | 3 | 40 | 12 | 40 | 24 | 1 |
| 17 | P51B | 4 | 46 | 18 | 2 | 42 | 16 | 42 | 24 | 1 |
| 18 | P51D | 6 | 48 | 18 | 2 | 42 | 23 | 42 | 24 | 1 |
| 19 | P38G | 6 | 36* | 19 | 2 | 36 | 19 | 39 | 20 | 2 |
| 20 | P38J | 6 | 44* | 23 | 3 | 40 | 25 | 44 | 26 | 2 |
| 21 | B17F | 9 | 0 | 42 | 9 | 28 | 90 | 33 | 8 | 4 |
| 22 | B17G | 10 | 0 | 43 | 16 | 28 | 90 | 31 | 12 | 4 |
| 23 | B24D | 9 | 0 | 32 | 9 | 30 | 90 | 25 | 6 | 4 |
| 24 | B24J | 9 | 0 | 33 | 13 | 30 | 90 | 24 | 8 | 4 |

* At altitudes greater than or equal to 20000 feet, the maneuverability ratings of the P38G and P38J are reduced to 27 and 33, respectively.

**CN** cannon rating; this is the defensive fire rating for heavy bombers
**MV** maneuverability rating
**DU** durability rating
**RR** rocket rating
**BL** bomb load rating
**SP** speed ratings; miles per 10-minute pulse
**FU** operational fuel limit; fuel used before turning back
**MA** maximum altitude
**CL** climb rate; thousands of feet per 10-minute pulse
**C** aircraft class

## CRITICAL INDUSTRY EFFECTS

| CRITICAL IND. | DEPENDENT INDUSTRIES |
|---|---|
| Railyard | U-boat, Armaments, Aircraft |
| Ball Bearings | Armaments, Aircraft |
| Chemicals | Oil, AvGas, Rubber, Armaments |
| Electric Power | All Other Industries |
| Steel | U-boat, Armaments |
| Rubber | Armaments |

## INDUSTRY DEFENSE, REBUILD RATE, & OPTIMUM LEVEL

| INDUSTRY TYPE | DEFENSE | REBUILD RATE | OPTIMUM LEVEL |
|---|---|---|---|
| railyard | 6 | 8% | 2 |
| ball bearings | 12 | 5% | 5 |
| chemicals | 7 | 5% | 6 |
| oil | 9 | 7% | 5 |
| aviation gas | 9 | 7% | 10 |
| electric power | 30 | 1% | 3 |
| steel | 12 | 2% | 8 |
| rubber | 10 | 5% | 10 |
| U-boat | 13 | 3% | 8 |
| armaments | 12 | *4% | 50 |
| aircraft | 10 | *4% | 50 |
| V-weapon | 10 | 4% | 10 |

* The build chance for armaments will increase to 12% and the build chance for aircraft will increase to 20% starting 1/44.

## USAAF REPLACEMENT SCHEDULE

| AIRCRAFT TYPE | AIRCRAFT PER DAY | AIRCRAFT PER DAY | AIRCRAFT PER DAY |
|---|---|---|---|
| P40E | 8/43 = 9 | 1/44 = 1 | |
| P47B | 8/43 = 3 | 9/43 = 1 | |
| P47D | 8/43 = 0 | 9/43 = 12 | 1/44 = 18 |
| P51B | 8/43 = 0 | 11/43 = 3 | 4/44 = 1 |
| P51D | 8/43 = 0 | 3/44 = 18 | |
| P38G | 8/43 = 9 | 12/43 = 1 | |
| P38J | 8/43 = 0 | 12/43 = 12 | |
| B17F | 8/43 = 1 | | |
| B17G | 8/43 = 18 | | |
| B24D | 8/43 = 3 | 10/43 = 1 | |
| B24J | 8/43 = 0 | 10/43 = 12 | 1/44 = 18 |

## LUFTWAFFE AIRCRAFT PRODUCTION RATES

| | AIRCRAFT PRODUCED PER 100 FACTORIES | LATEST POSSIBLE AVAILABILITY DATE |
|---|---|---|
| ME109G | 15 | 8/43 |
| ME109K | 12 | 8/44 |
| FW190A | 10 | 8/43 |
| FW190D | 9 | 6/44 |
| FW190F | 8 | 8/43 |
| TA152H | 8 | 1/45 |
| DO335A | 7 | 3/45 |
| ME410A | 7 | 8/43 |
| ME110G | 8 | 8/43 |
| JU88G | 0* | 8/43 |
| ME262A | 4 | 11/44 |
| ME163B | 6 | 9/44 |
| HE162A | 10 | 3/45 |

* Only a fraction of the production of this type of aircraft was available for daylight air defense of the Reich, so the German player will automatically receive one JU88G per day.

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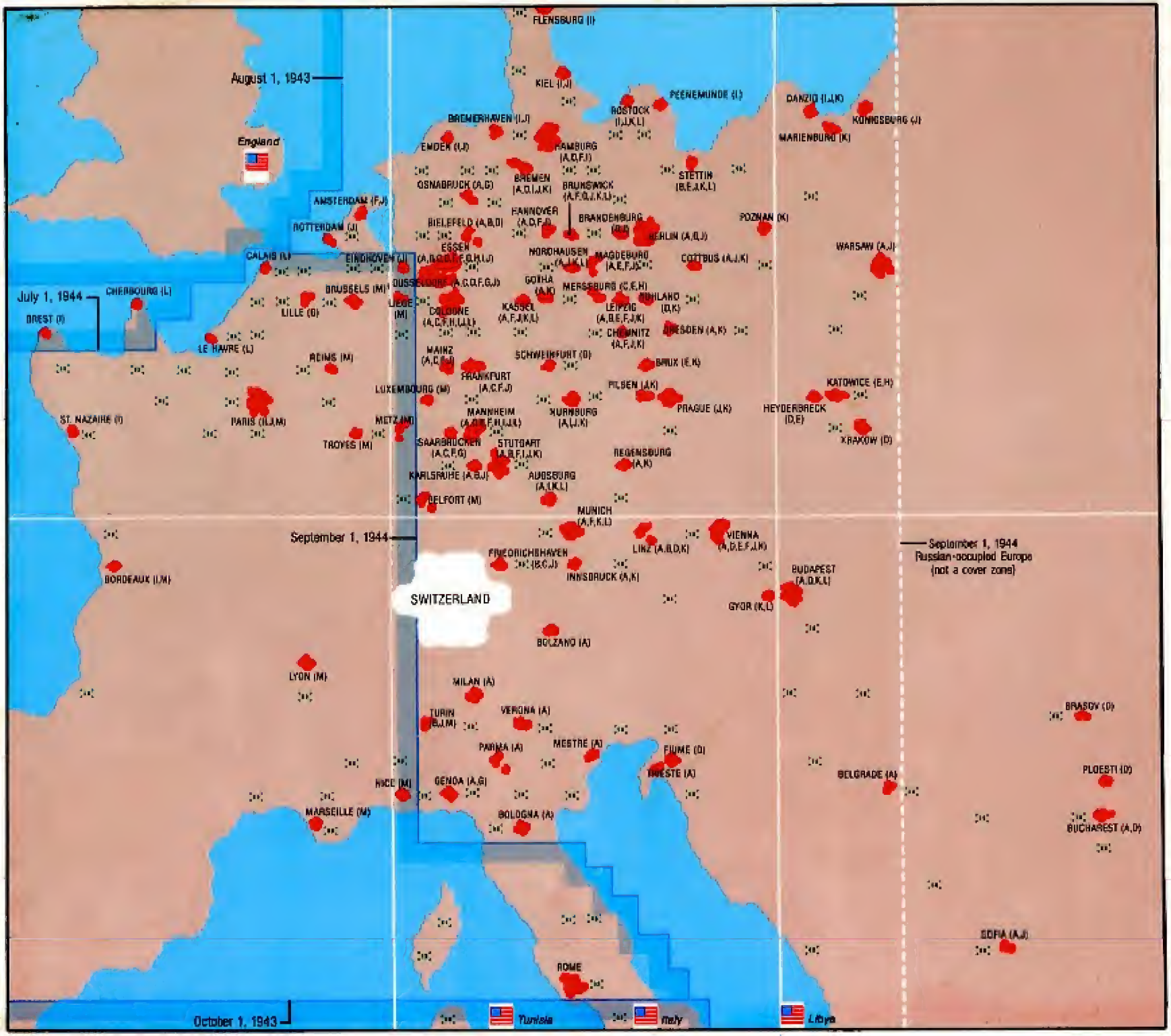


# U.S.A.A.F. MAP KEY

= Luftwaffe airfield site

= USAAF airbase

= Allied cover zones

**WEATHER ZONES:**

| | | |
|---|---|---|
| NORTH WEST EUROPE | NORTH CENTRAL EUROPE | NORTH EAST EUROPE |
| SOUTH WEST EUROPE | SOUTH CENTRAL EUROPE | SOUTH EAST EUROPE |

**TARGET/MISSION TYPE:**

A = railyard
B = ball bearings
C = chemicals
D = oil
E = aviation gas
F = electric power
G = steel
H = rubber
I = U-boat
J = armaments
K = aircraft
L = V-weapon
M = Overlord

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## VICTORY POINT MATRIX

| INDUSTRY | 0-19 | 20-29 | 30-39 | 40-49 | 50-59 | 60-69 | 70-79 | 80-89 | 90+ |
|---|---|---|---|---|---|---|---|---|---|
| railyard | 20 | 15 | 10 | 5 | 4 | 3 | 2 | 1 | 0 |
| ball bearings | 5 | 4 | 3 | 2 | 1 | 0 | 0 | 0 | 0 |
| chemicals | 5 | 4 | 3 | 2 | 1 | 0 | 0 | 0 | 0 |
| oil | 20 | 15 | 10 | 5 | 4 | 3 | 2 | 1 | 0 |
| aviation gas | 5 | 4 | 3 | 2 | 1 | 0 | 0 | 0 | 0 |
| electric power | 20 | 15 | 10 | 5 | 4 | 3 | 2 | 1 | 0 |
| steel | 5 | 4 | 3 | 2 | 1 | 0 | 0 | 0 | 0 |
| rubber | 5 | 4 | 3 | 2 | 1 | 0 | 0 | 0 | 0 |
| U-boat | 5 | 4 | 3 | 2 | 1 | 1 | 1 | 0 | 0 |
| armaments* | 30 | 25 | 20 | 15 | 10 | 5 | 3 | 1 | 0 |

* Divide armaments level by 10 before comparing to the damage matrix.

## AIRCRAFT DATA

| ID# | TYPE | CN | MV | DU | RR | SP | FU | MA | CL | C |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | ME109G | 8 | 38 | 17 | 2 | 42 | 7 | 38 | 30 | 1 |
| 2 | ME109K | 7 | 50 | 17 | 2 | 46 | 6 | 41 | 41 | 1 |
| 3 | FW190A | 10 | 44 | 18 | 2 | 44 | 8 | 37 | 18 | 1 |
| 4 | FW190D | 6 | 48 | 19 | 2 | 46 | 8 | 39 | 28 | 1 |
| 5 | FW190F | 15 | 32 | 25 | 6 | 42 | 8 | 35 | 12 | 1 |
| 6 | TA152H | 13 | 48 | 24 | 2 | 50 | 10 | 49 | 48 | 1 |
| 7 | DO335A | 19 | 45 | 19 | 2 | 50 | 13 | 37 | 30 | 3 |
| 8 | ME410A | 13 | 22 | 20 | 6 | 40 | 17 | 33 | 18 | 2 |
| 9 | ME110G | 18 | 18 | 19 | 4 | 36 | 13 | 26 | 12 | 2 |
| 10 | JU88G | 12 | 18 | 23 | 4 | 36 | 21 | 32 | 12 | 2 |
| 11 | ME262A | 20 | 14 | 14 | 6 | 68 | 5 | 38 | 28 | 7 |
| 12 | ME163B | 10 | 40 | 10 | 0 | 96 | 2 | 40 | 40 | 8 |
| 13 | HE162A | 10 | 21 | 7 | 2 | 52 | 4 | 39 | 39 | 6 |

| ID# | TYPE | CN | MV | DU | BL | SP | FU | MA | CL | C |
|---|---|---|---|---|---|---|---|---|---|---|
| 14 | P40E | 6 | 37 | 14 | 1 | 40 | 10 | 30 | 18 | 1 |
| 15 | P47B | 8 | 44 | 22 | 2 | 40 | 10 | 42 | 18 | 1 |
| 16 | P47D | 8 | 46 | 23 | 3 | 40 | 12 | 40 | 24 | 1 |
| 17 | P51B | 4 | 46 | 18 | 2 | 42 | 16 | 42 | 24 | 1 |
| 18 | P51D | 6 | 48 | 18 | 2 | 42 | 23 | 42 | 24 | 1 |
| 19 | P38G | 6 | 36* | 19 | 2 | 36 | 19 | 39 | 20 | 2 |
| 20 | P38J | 6 | 44* | 23 | 3 | 40 | 25 | 44 | 26 | 2 |
| 21 | B17F | 9 | 0 | 42 | 9 | 28 | 90 | 33 | 8 | 4 |
| 22 | B17G | 10 | 0 | 43 | 16 | 28 | 90 | 31 | 12 | 4 |
| 23 | B24D | 9 | 0 | 32 | 9 | 30 | 90 | 25 | 6 | 4 |
| 24 | B24J | 9 | 0 | 33 | 13 | 30 | 90 | 24 | 8 | 4 |

* At altitudes greater than or equal to 20000 feet, the maneuverability ratings of the P38G and P38J are reduced to 27 and 33, respectively.

**CN** cannon rating: this is the defensive fire rating for heavy bombers
**MV** maneuverability rating.
**DU** durability rating
**RR** rocket rating
**BL** bomb load rating
**SP** speed ratings: miles per 10-minute pulse
**FU** operational fuel limit: fuel used before turning back
**MA** maximum altitude
**CL** climb rate: thousands of feet per 10-minute pulse
**C** aircraft class

## CRITICAL INDUSTRY EFFECTS

| CRITICAL IND. | DEPENDENT INDUSTRIES |
|---|---|
| Railyard | U-boat, Armaments, Aircraft |
| Ball Bearings | Armaments, Aircraft |
| Chemicals | Oil, AvGas, Rubber, Armaments |
| Electric Power | All Other Industries |
| Steel | U-boat, Armaments |
| Rubber | Armaments |

## INDUSTRY DEFENSE, REBUILD RATE, & OPTIMUM LEVEL

| INDUSTRY TYPE | DEFENSE | REBUILD RATE | OPTIMUM LEVEL |
|---|---|---|---|
| railyard | 6 | 8% | 2 |
| ball bearings | 12 | 5% | 5 |
| chemicals | 7 | 5% | 6 |
| oil | 9 | 7% | 5 |
| aviation gas | 9 | 7% | 10 |
| electric power | 30 | 1% | 3 |
| steel | 12 | 2% | 8 |
| rubber | 10 | 5% | 10 |
| U-boat | 13 | 3% | 8 |
| armaments | 12 | *4% | 50 |
| aircraft | 10 | *4% | 50 |
| V-weapon | 10 | 4% | 10 |

* The build chance for armaments will increase to 12% and the build chance for aircraft will increase to 20% starting 1/44.

## USAAF REPLACEMENT SCHEDULE

| AIRCRAFT TYPE | AIRCRAFT PER DAY | AIRCRAFT PER DAY | AIRCRAFT PER DAY |
|---|---|---|---|
| P40E | 8/43 = 9 | 1/44 = 1 | |
| P47B | 8/43 = 3 | 9/43 = 1 | |
| P47D | 8/43 = 0 | 9/43 = 12 | 1/44 = 18 |
| P51B | 8/43 = 0 | 11/43 = 3 | 4/44 = 1 |
| P51D | 8/43 = 0 | 3/44 = 18 | |
| P38G | 8/43 = 9 | 12/43 = 1 | |
| P38J | 8/43 = 0 | 12/43 = 12 | |
| B17F | 8/43 = 1 | | |
| B17G | 8/43 = 18 | | |
| B24D | 8/43 = 3 | 10/43 = 1 | |
| B24J | 8/43 = 0 | 10/43 = 12 | 1/44 = 18 |

## LUFTWAFFE AIRCRAFT PRODUCTION RATES

| | AIRCRAFT PRODUCED PER 100 FACTORIES | LATEST POSSIBLE AVAILABILITY DATE |
|---|---|---|
| ME109G | 15 | 8/43 |
| ME109K | 12 | 8/44 |
| FW190A | 10 | 8/43 |
| FW190D | 9 | 6/44 |
| FW190F | 8 | 8/43 |
| TA152H | 8 | 1/45 |
| DO335A | 7 | 3/45 |
| ME410A | 7 | 8/43 |
| ME110G | 8 | 8/43 |
| JU88G | 0* | 8/43 |
| ME262A | 4 | 11/44 |
| ME163B | 6 | 9/44 |
| HE162A | 10 | 3/45 |

* Only a fraction of the production of this type of aircraft was available for daylight air defense of the Reich, so the German player will automatically receive one JU88G per day.

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